

Application No. 10/039,344
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Currently Amended) An apparatus for processing a radiation image, comprising:

a pixel-value analyzing section to analyze ~~a pixel-value~~
pixel-values within a step pattern of a wedge area in which ~~a~~
5 ~~density varies step by step, wherein~~ said radiation image,
includes said wedge area being an area in which a density varies
step by step; and

a suspicious region analyzing section to detect a candidate
of a suspicious region by using information outputted from said
10 pixel value analyzing section; and

a step position-detecting device for detecting a step
position of said wedge area based on a feature of a change amount
of the pixel-values;

wherein a region of interest is determined based on said
15 step position detected by said step position-detecting device;
and

wherein said step position-detecting device obtains profiles
at a plurality of positions in a plurality of directions to find
an area at which said pixel-values vary step by step, to detect
20 said step position.

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2. (Currently Amended) The apparatus of claim 1, wherein
said suspicious region analyzing section comprises [[:]] a
gradation-adjusting section to adjust a gradation of said
radiation image based on the ~~basis of~~ information, ~~pertaining to~~
5 ~~said pixel values~~, outputted by said pixel-value analyzing
section.

3. (Currently Amended) The apparatus of claim 1, wherein
said suspicious region analyzing section comprises [[:]] a
parameter-adjusting section to adjust a parameter for detecting
said candidate of said suspicious region based on the ~~basis of~~
5 ~~information, pertaining to said pixel-value~~, outputted by said
pixel-value analyzing section.

4. (Currently Amended) The apparatus of claim 2, further
comprising [[:]] a ~~first~~ suspicious region detecting section to
detect said candidate of said suspicious region based on the
~~basis of~~ said radiation image [[:]] having said gradation of
5 which is adjusted by said gradation-adjusting section.

5. (Currently Amended) The apparatus of claim 3, further
comprising [[:]] a ~~second~~ suspicious region detecting section to
detect said candidate of said suspicious region by using said
parameter for detecting said candidate of said suspicious region.

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5 said parameter being adjusted by said parameter-adjusting section.

6. (Currently Amended) The apparatus of claim 4, further comprising [[:]] an image-outputting section to output said radiation image [[:]] having said gradation of which is adjusted by said gradation-adjusting section.

7. (Currently Amended) The apparatus of claim 4, further comprising [[:]] an outputting section to output both a result of detecting said suspicious region ~~in~~ by said ~~first~~ suspicious region detecting section and said radiation image having said gradation adjusted by said gradation-adjusting section.

8. (Currently Amended) The apparatus of claim 5, wherein
said suspicious region analyzing section comprises a
gradation-adjusting section to adjust a gradation of said
radiation image based on the information outputted by said pixel-
5 value analyzing section; and

wherein the apparatus further ~~comprising:~~ comprises an
outputting section to output both a result of detecting said
suspicious region ~~in~~ by said ~~second~~ suspicious region detecting
section and said radiation image having said gradation adjusted
10 by said gradation-adjusting section.

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Claims 9 and 10 (Canceled).

11. (Currently Amended) The apparatus of claim 2, further comprising [[:]] an image-outputting section to output said radiation image [[:]] having said gradation ~~of~~ which is adjusted by said gradation-adjusting section.

12. (Currently Amended) The apparatus of claim 2, wherein said radiation image is a mammography having said gradation adjusted by said gradation-adjusting section, and the apparatus further comprising: comprises an image-classifying section to
5 classify said mammography, ~~said gradation of which adjusted by said gradation-adjusting section, corresponding to~~ based on a degree of involution of mammary glands.

Claim 13 (Canceled).

14. (Currently Amended) ~~The~~ An apparatus ~~of claim 8,~~
further for processing a radiation image, comprising:
a pixel-value analyzing section to analyze pixel-values
within a step pattern of a wedge area in said radiation image,
5 said wedge area being an area in which a density varies step by
step;

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10 a suspicious region analyzing section to detect a candidate
of a suspicious region using information outputted from said
pixel value analyzing section, said suspicion region analyzing
section comprising: (i) a parameter-adjusting section to adjust a
parameter for detecting said candidate of said suspicious region
based on the information outputted by said pixel-value analyzing
section, and (ii) a gradation-adjusting section to adjust a
gradation of said radiation image based on the information
15 outputted by said pixel-value analyzing section;

20 a suspicious region detecting section to detect said
candidate of said suspicious region using said parameter for
detecting said candidate of said suspicious region, said
parameter being adjusted by said parameter-adjusting section;
an outputting section to output both a result of detecting
said suspicious region by said suspicious region detecting
section and said radiation image having said gradation adjusted
by said gradation-adjusting section; and

25 a step position-detecting device for detecting a step
position of said wedge area ~~based on the basis of~~ a feature of a
change amount of ~~the~~ pixel-values;

wherein a region of interest is determined based on the
~~basis of~~ said step position detected by said step
position-detecting device.

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15. (Currently Amended) ~~The An apparatus of claim 8,~~
~~wherein said radiation image for processing a radiation image~~
~~that~~ is a mammography, further said apparatus comprising:

a pixel-value analyzing section to analyze pixel-values
5 within a step pattern of a wedge area in said radiation image,
said wedge area being an area in which a density varies step by
step;

a suspicious region analyzing section to detect a candidate
of a suspicious region using information outputted from said
10 pixel value analyzing section, said suspicion region analyzing
section comprising: (i) a parameter-adjusting section to adjust a
parameter for detecting said candidate of said suspicious region
based on the information outputted by said pixel-value analyzing
section, and (ii) a gradation-adjusting section to adjust a
15 gradation of said radiation image based on the information
outputted by said pixel-value analyzing section;

a suspicious region detecting section to detect said
candidate of said suspicious region using said parameter for
detecting said candidate of said suspicious region, said
20 parameter being adjusted by said parameter-adjusting section;

an outputting section to output both a result of detecting
said suspicious region by said suspicious region detecting
section and said radiation image having said gradation adjusted
by said gradation-adjusting section; and

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25 an image-classifying section to classify said mammography
[[,]] having said gradation ~~of which~~ adjusted by said
gradation-adjusting section, ~~corresponding to~~ based on a degree
of involution of mammary glands.

16. (Currently Amended) ~~The~~ An apparatus ~~of claim 6,~~ for
processing a radiation image, comprising:

a pixel-value analyzing section to analyze pixel-values
within a step pattern of a wedge area in said radiation image,
said wedge area being an area in which a density varies step by
step;

a suspicious region analyzing section to detect a candidate
of a suspicious region using information outputted from said
pixel value analyzing section, said suspicious region analyzing
section comprising a gradation-adjusting section to adjust a
gradation of said radiation image based on the information
outputted by said pixel-value analyzing section;

a suspicious region detecting section to detect said
candidate of said suspicious region based on said radiation image
having said gradation which is adjusted by said gradation-
adjusting section; and

an image-outputting section to output said radiation image
having said gradation which is adjusted by said gradation-
adjusting section;

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wherein said image-outputting section outputs at least one of a voltage applied to a radiation tube, a mA mAs value, a sec. value, a kind of an added filter, a kind of a radiation tube, a thickness of a focal point size, a compressing pressure, an enlarging ~~late~~ rate and a tilt angle onto a partial area of said radiation image, on which a subject image does not overlap.

17. (Currently Amended) The apparatus of claim 15, wherein said outputting section outputs at least one of a voltage applied to a radiation tube, a mAs value, a kind of an added filter, a kind of a radiation tube, a thickness of a focal point size, a compressing pressure, an enlarging ~~late~~ rate and a tilt angle onto said mammography.

18. (Currently Amended) The apparatus of claim 4, where wherein said suspicious region analyzing section comprises [[:]] a parameter-adjusting section to adjust a parameter for detecting said candidate of said suspicious region based on the ~~basis~~ of information, ~~pertaining to said pixel-value~~, outputted by said pixel-value analyzing section; and ~~a second~~

wherein the apparatus further comprises another suspicious region detecting section to detect said candidate of said suspicious region by using said parameter for detecting said candidate of said suspicious region, said parameter being adjusted by said parameter-adjusting section.